EUROPEAN PATENT APPLICATION

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(54) Educational aid for teaching computer programming.

(57) An educational aid for use in teaching computer programming comprises a tray (1-Fig. 1) having rows of compartments (3), each adapted to contain a supply of identical labels having thereon a visible binary code in the form of a bar code. The compartments (3) in the rows (4) at one end of the tray (1) are disposed in an array corresponding to the keyboard of a typical keyboard input terminal for containing binary coded labels representing the characters and symbols of a keyboard in a similar sequence. The aid also includes a coding board (27-Fig. 5) having a multiplicity of rows of pockets (24) for holding individual binary coded labels selected from the tray (1) and disposed in the pockets (24) in a required sequence to produce a computer program. Each pocket (24) has a window (25) at its front face through which a coded label inserted into the pocket (24) can be read by a scanning device.

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Fig.1

Fig.5
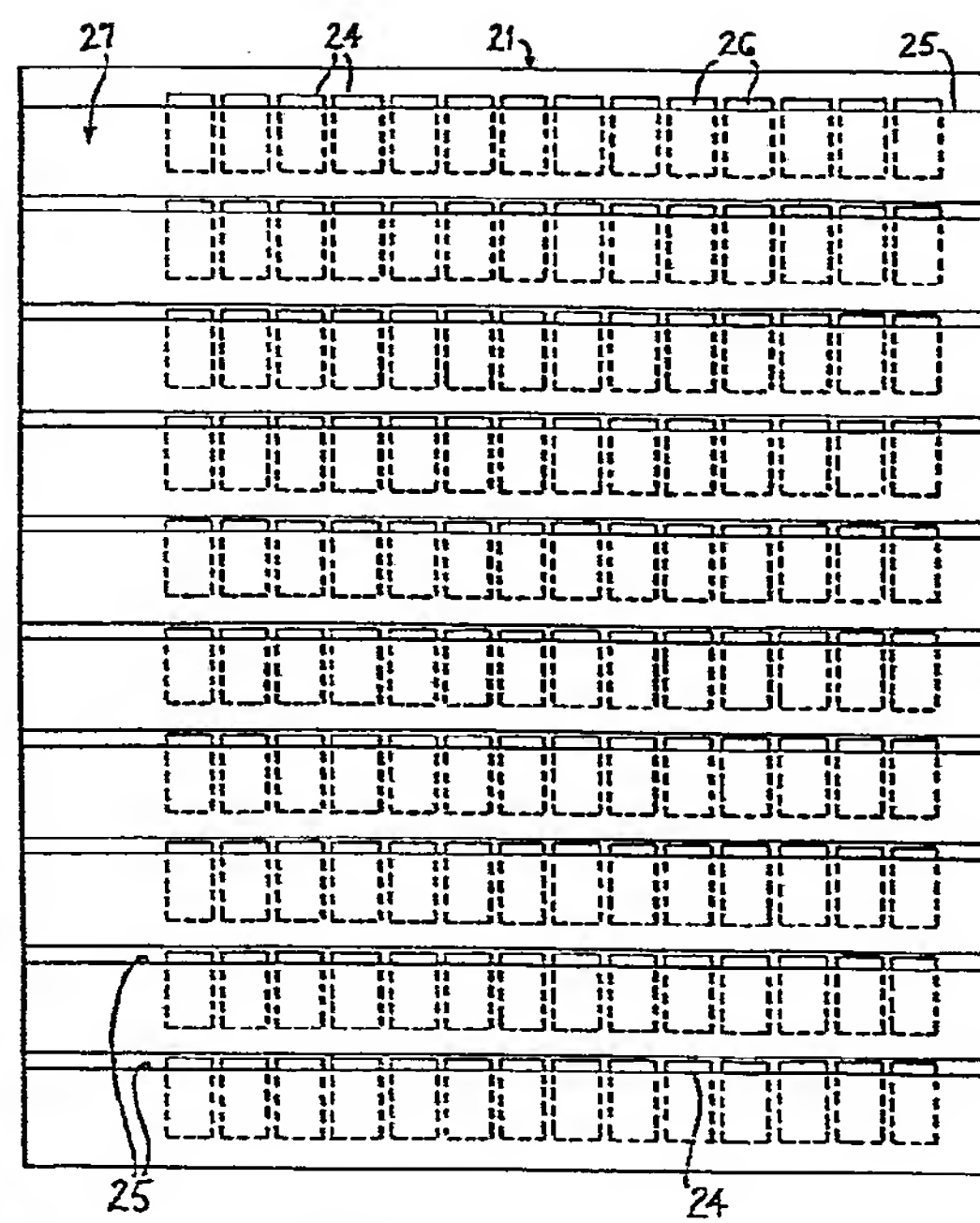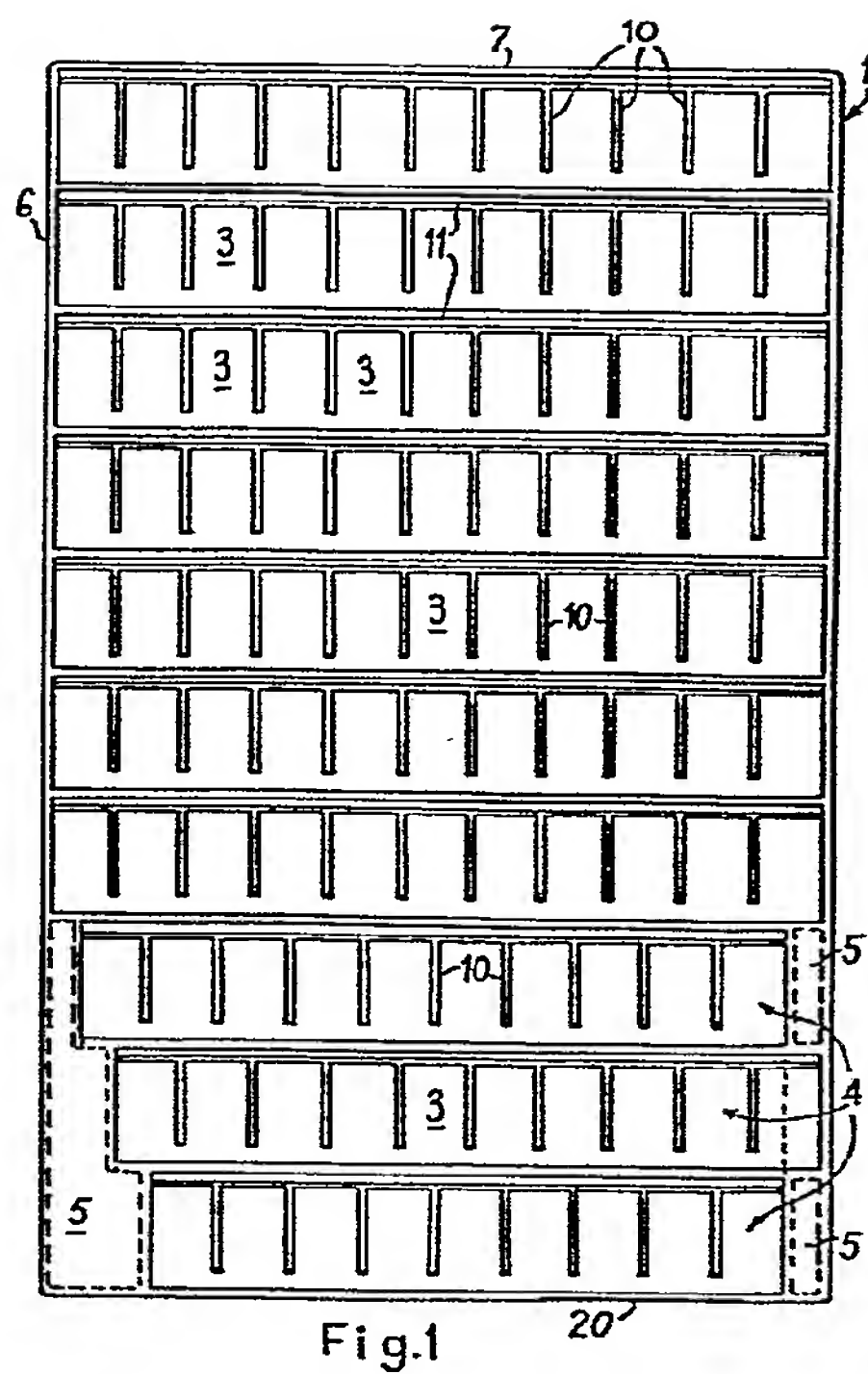
EDUCATIONAL AID FOR TEACHING COMPUTER PROGRAMMING

1   The present invention relates to an educational
aid for use in teaching computer programming to students
and, more particularly, to such an aid for use in
initiating younger students into the techniques of
5   computer programming.

     The present invention consists in an educational
aid for use in teaching computer programming, comprising,
in combination, a tray having a multiplicity of rows of
compartments, each adapted to contain a supply of
10   identical labels having thereon a visible binary code,
at least some of the rows of compartments at one end of
the tray being disposed in an array corresponding to
the keyboard of a typical keyboard input terminal for
containing binary coded labels representing the characters
15   and symbols of a keyboard in a similar sequence,
and a coding board having a multiplicity of rows of
pockets for holding individual binary coded labels
selected from the tray and disposed in the pockets in
a required sequence to produce a computer program, each
20   pocket having a window at its front face through which
a coded label inserted into the pocket can be read by
a scanning device. The binary code used on the labels
is preferably of the kind commonly referred to as a bar
code.

25   With the invention, a student may compile a
computer program by simply selecting appropriate labels
from the tray and disposing them in a desired sequence
along the rows of pockets in the coding board. The
resulting program may be entered into a suitable computer
30   by scanning the labels in the pockets in the appropriate
sequence with a manual light-reader which reads the
binary codes on the labels in the pockets and feeds
corresponding binary signals into the computer.

     Conveniently, each compartment of the tray is
35   labelled with a human-readable keyword, character or symbol

1   identifying the coded labels intended to be contained
in the compartments. For example, it may have a zone in
a readily visible position on one of its walls adapted
to receive an adhesive paper strip displaying the key-
5   word or character. Each label preferably has the corres-
ponding human-readable keyword or character printed on it
to identify the label. The labels and the compartments,
or labelling strips attached to the compartments, may be
colour coded to facilitate selection and replacement of
10   labels.

The tray may have a cover or lid which fits over
the tray to close the compartments. This lid is prefer-
ably provided on its inside with means which, when the lid
is fitted on to the tray, prevents the coded labels from
15   being inadvertently dislodged from their correct compart-
ments and becoming mixed.

The invention also consists in a tray or coding
board for use in the educational aid according to the
invention.

20   In order that the invention may be more readily
understood, reference will now be made to the accompany-
ing drawings, in which:-

Figs. 1 and 2 respectively illustrate a plan
view and a longitudinal sectional view of a tray according
25   to the invention,

Figs. 3 and 4 respectively illustrate an under-
neath plan and a side elevation of a lid for the tray
shown in Figs. 1 and 2,

Figs. 5 and 6 respectively illustrate a plan view
30   and a longitudinal sectional view of a coding board
according to the invention and,

Fig. 7 illustrates a sample label for use with
the invention.

Referring to Figs. 1 and 2 of the drawings, the
35   tray 1 is of rectangular shape in plan and comprises a

plurality of rows of identical compartments 3 extending
width-wise of the tray. Apart from three rows 4 of
compartments at one end of the tray, the rows extend
across the full width of the tray. The three rows 4

at said one end of the tray are arranged in an array
corresponding to the keyboard of a typical keyboard
input terminal for a computer and are intended to contain
coded labels representing the letters and numbers of a
typical keyboard, for example, a QWERTY keyboard, in an

identical sequence. The three rows 4 have less numbers of
compartments than the other rows and the tray has lands 5
at the ends of these rows to compensate for the reduced
numbers of compartments.

As shown more particularly in Fig. 2, the tray
comprises side and end walls 6,7 enclosing a central
portion of corrugated configuration. The corrugations
8,9 extend parallel to the end walls 7. The upwardly
projecting corrugations 8 are of V-shaped section whilst
the downwardly projecting corrugations or troughs 9,

which contain the compartments 3, are of frusto V-shape
section. The troughs 9 are divided into the individual
compartments 3 by partitions 10 extending longitudinally
of the tray and part-way up the height of the troughs.
Except for the three rows 4, the partitions 10 are

aligned in columns. The marginal zones along the top
front faces of the corrugations 8 are formed with shallow
rebates 11 for receiving self-adhesive strips displaying
human-readable keywords, characters or symbols identify-
ing the coded labels to be inserted in the individual

compartments.

In use, each of the compartments contains a supply
of identical labels having printed thereon a visible
binary code, such as a bar code, representing a selected
computer keyword, character or symbol. A sample label,

which is preferably formed from anti-static material, is

1   illustrated in Fig. 7.   A bar code is printed at 12 and
the corresponding human-readable keyword is printed in
the zone 13.   The zone 13 may also be coloured in accord-
ance with a colour coding used   on the identifying strips

5   attached to the rebates 11 of the compartments to facilitate
selection and replacement of labels in the compartments.
The labels may be supplied in perforated sheets so that
individual labels can readily be separated and lodged in
the appropriate compartments of the tray.   They are stacked

10   one behind the other in their compartments and normally
rest face downwards against the front walls of the compart-
ments so that the keywords etc. displayed along the rebates
11 are visible.

Figs. 3 and 4 illustrate the lid 14 for the tray 1.

15   It is of rectangular shape in plan and comprises a top
15 and downwardly projecting side and end flanges 16.
Small tapered ribs 17 are formed on the insides of the
end flanges and engage with the outsides of the end
walls 7 of the tray, which may also taper slightly inwards,

20   when the lid is fitted onto the tray so as to provide an
interference fit between the lid and tray for retaining
the lid in position.   Projecting downwardly from the top
of the lid in positions corresponding to the troughs 9
of the tray are a plurality of webs 18.   These webs

25   extend parallel to the end flanges of the lid and terminate
short of the side walls 6 and lands 5 of the tray so
that when the lid is fitted onto the tray, the top 15 of
the lid engages the walls 6,7 and lands 5 of the tray
and the bottom edges of the webs 18 substantially engage

30   the tops of the tray partitions 10.   These webs 18 co-
operate with the partitions 10 to prevent the labels
from inadvertently being dislodged from their correct
compartments and becoming mixed when the closed tray is
handled.   Hollow ribs 19 extending width-wise of the lid

35   are formed on the outside of the lid top 15 adjacent

1   opposite ends. In a stack of closed trays, these ribs
engage the insides of the end walls 7 of the next tray
above to stabilise the stack. When the tray is in use,
the lid is fitted to the underneath of the tray, to
5   avoid it being mislaid or causing a nuisance, and serves
as a base for the tray. A shallow recess (not shown)
may be formed on the outside of the lid top for receiving
an adhesive label identifying the contents of the closed
tray and a shallow recess 20 (Fig. 1) for a similar
10   purpose may also be formed on one end wall of the tray.
The tray 1 and the lid 14 may be produced as plastics
mouldings.

The coding board 21 illustrated in Figs. 5 and 6
is of laminated construction and may be produced from
15   plastics laminations. It is of rectangular shape in
plan and comprises a base card or layer 22, a collator
layer 23 superimposed on and bonded to the base layer
and defining a plurality of rows of rectangular openings
24 of sufficient size to contain coded labels selected
20   from the tray 1, and a plurality of transparent strips
25 fastened to the front face of the collator layer 23
in positions over the rows of openings. The strips 25 are
disposed with their top edges spaced a short distance
below the top edges of the openings 24 in the collator
25   layer so as to provide gaps 26 through which the coded
labels can be inserted into the flat pockets defined
between the strips and the openings in the collator layer.
The strips are secured in position by bonding along bottom
and end margins of the strips.

30   When labels are inserted into the pockets, they fit
snugly in the pockets with the zones 13 (Fig. 7) projecting
from the gaps 26 onto the surfaces of the transparent strips
25, or the top end land portion of the collator layer,
immediately above the pockets. This facilitates removal
35   of the labels from the pockets.

1   The pockets are offset towards the right-hand side
of the board 21, as viewed in Fig. 5, to provide a wider
substantially flat marginal zone 27 on the left-hand side
of the board. When scanning the labels placed in the
5   pockets, a light reader is moved from left to right
along the rows and the wide left-hand marginal zone 27
provides an acceleration zone of satisfactory width
to permit the light reader to be accelerated to an approp-
riate speed to achieve correct reading of the bar codes
10   before scanning the first label in each row.

In order to produce a program, the required labels
are selected from the compartments 3 in the tray 1 and
are inserted into the pockets in the coding board 21 in
a required sequence and along successive rows of the
15   board. The program thereby compiled can be entered into
a suitable computer by successively scanning the labels
in the rows, through the transparent strips 25, with a
hand-held light reader which reads the bar codes on the
labels and supplies corresponding binary data to the
20   computer. The reader is traversed along successive rows
in contact with the strips 25 which provide flat trans-
parent surfaces for scanning purposes. When the program
has been entered in the computer, the labels may be removed
from the coding board 21 and be replaced in their approp-
25   riate compartments in the tray and another program may
be compiled and entered into the computer in a similar
manner.

Whilst a particular embodiment has been described,
it will be understood that modifications can be made
30   without departing from the scope of the invention. For
example, a transparent layer having slots cut or stamped
in positions corresponding to the gaps 26 may be adhered
to the collator layer 23 in place of the strips 25 in
order to form the pockets in the coding board.

CLAIMS

1.   An educational aid for use in teaching computer programming, characterised in that it comprises, in combination, a tray (1) having a multiplicity of rows of compartments (3), each adapted to contain a supply

5   of identical labels (Fig. 7) having thereon a visible binary code (12), at least some of the rows (4) of compartments (3) at one end of the tray being disposed in an array corresponding to the keyboard of a typical input terminal for containing binary coded labels rep-

10   resenting the characters and symbols of a keyboard in a similar sequence, and a coding board (21) having a multiplicity of rows of pockets (24) for holding indivi- dual binary coded labels selected from the tray (1) and disposed in the pockets in a required sequence to produce

15   a computer program, each pocket (24) having a window (25) at its front face through which a coded label inserted into the pocket can be read by a scanning device.

2.   An educational aid as claimed in claim 1, wherein the binary code (12) used on the labels (Fig. 7) is a

20   bar code.

3.   An educational aid as claimed in claim 1 or 2, wherein each compartment (3) of the tray (1) is labelled, or adapted to be labelled, with a human-readable keyword, character or symbol identifying the coded labels intended

25   to be contained in the compartments.

4.   An educational aid as claimed in claim 3, wherein each compartment (3) has a zone (11) in a readily visible position on one of its walls adapted to receive an adhesive paper strip displaying the keyword or character.

30 5.   An educational aid as claimed in any preceding claim,

wherein each label (Fig. 7) has the corresponding human-readable keyword or character printed on it to identify the label, the labels and the compartments (3) also being colour coded to facilitate selection and replace-
5   ment of labels.

6.   An educational aid as claimed in any preceding claim, wherein the tray (1) has a lid (14) which fits over the tray to close the compartments, the lid being provided on its inside with means (18) which, when the lid is
10 fitted on to the tray, prevents the coded labels from being inadvertently dislodged from their correct compartments and becoming mixed.

7.   An educational aid as claimed in any preceding claim, wherein the coding board (21) includes a zone
15 devoid of pockets at one end of the rows of pockets (24) to provide an acceleration zone to permit, in operation, the scanning device to be accelerated to a speed to achieve correct reading of the codes on the labels in the pockets in the rows before scanning the first label
20 in each row.

8.   An educational aid as claimed in any preceding claim, wherein the tray (1) includes a central corrugated portion defining the rows of compartments (3), the corrugations being mutually parallel, and being defined
25 by upwardly projecting, inverted generally V-shaped portions (8) and downwardly projecting generally frusto V-shaped portions (9), the troughs defined by the corrugation portions (8, 9) being divided into the individual compartments (3) by partitions (10) extending part-way
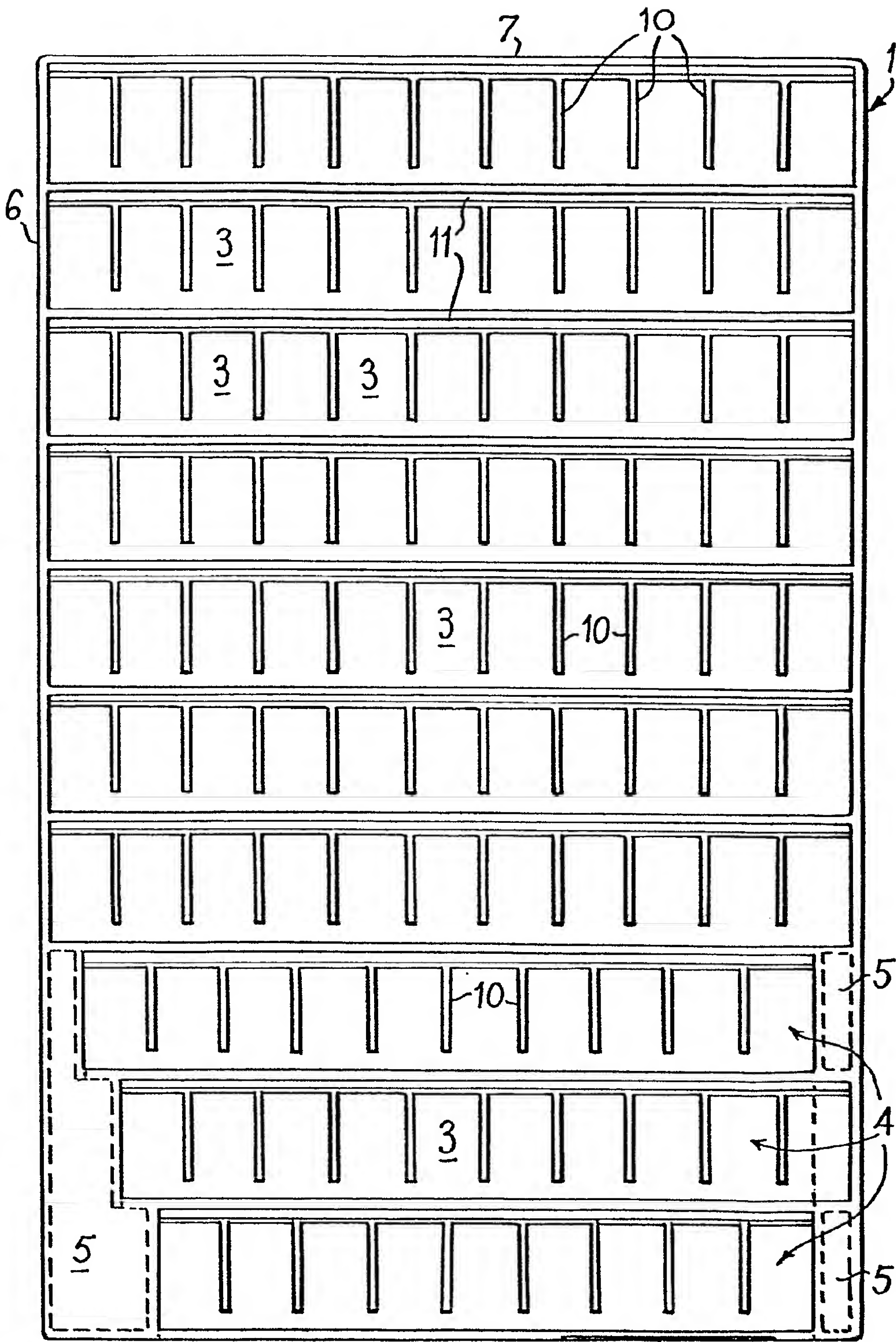30 up the height of the troughs.

Fig.1

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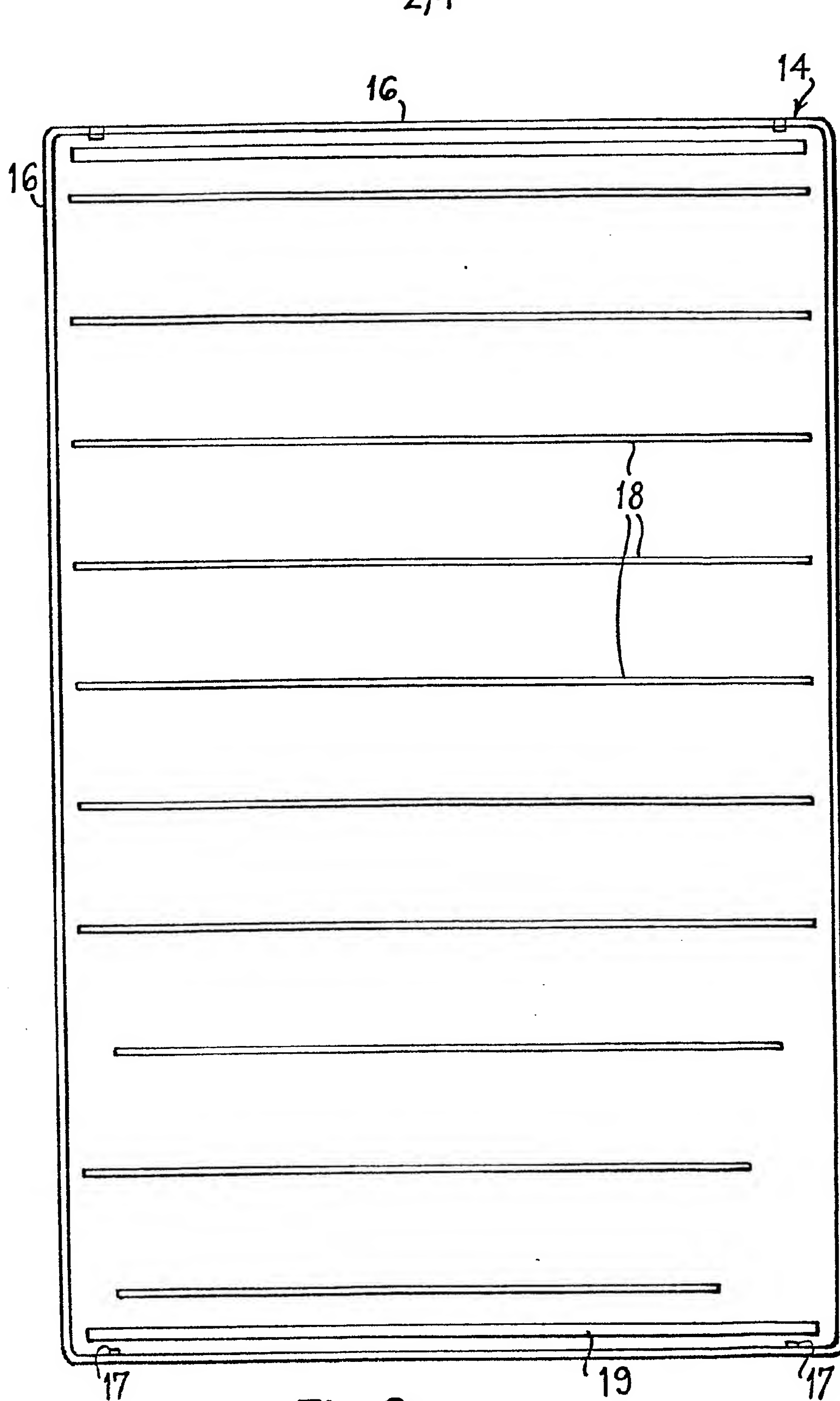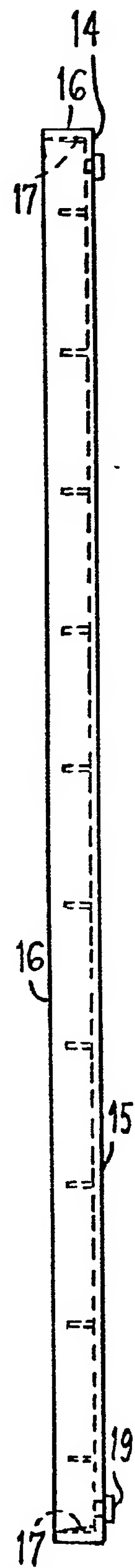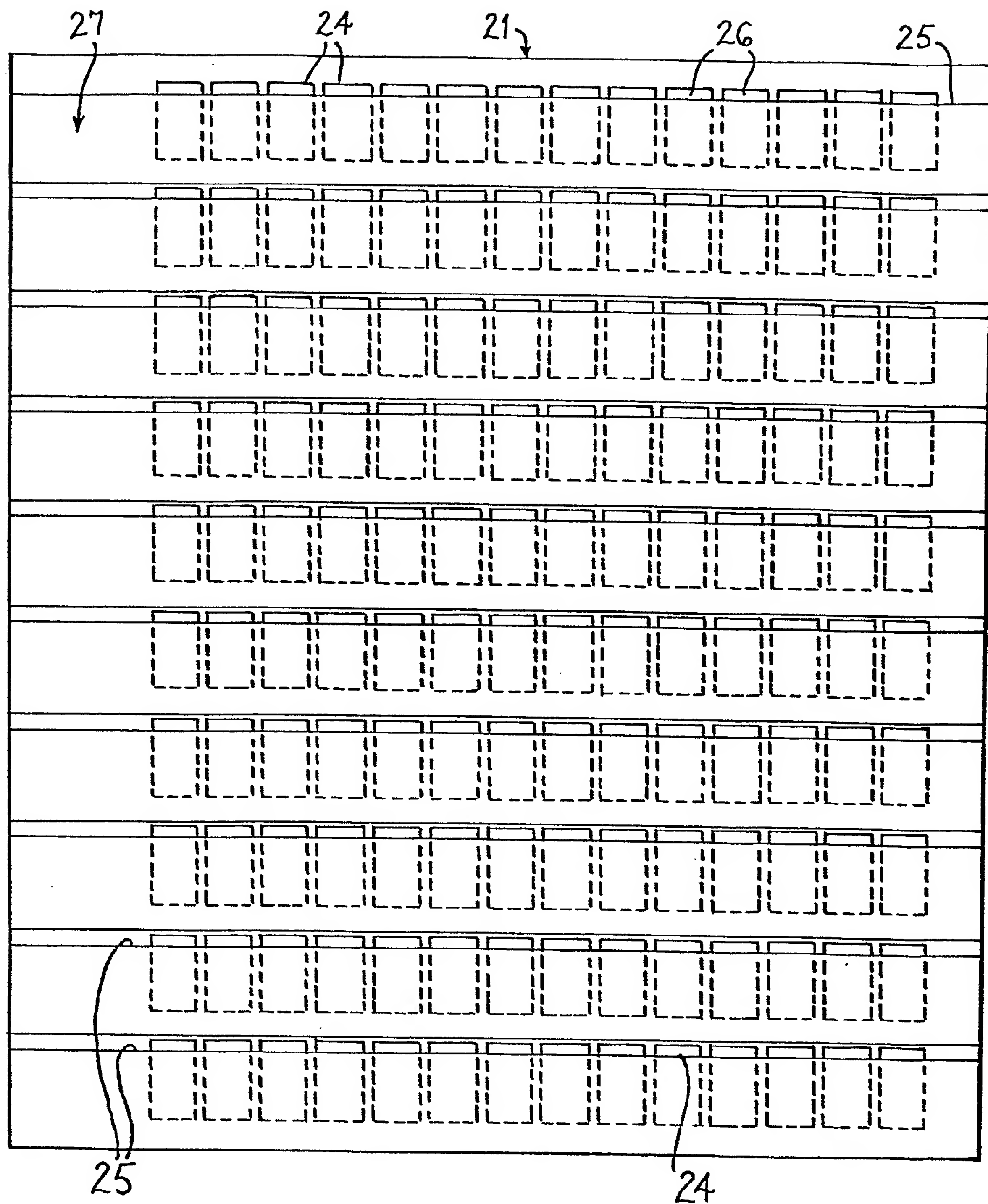

Fig.3

Fig.4

Fig.5

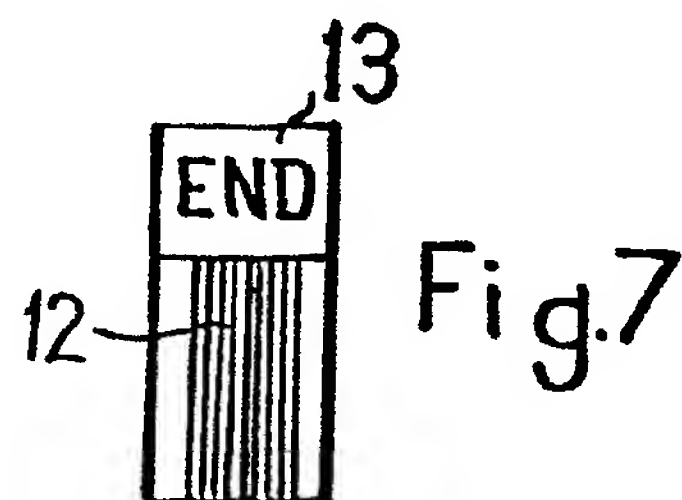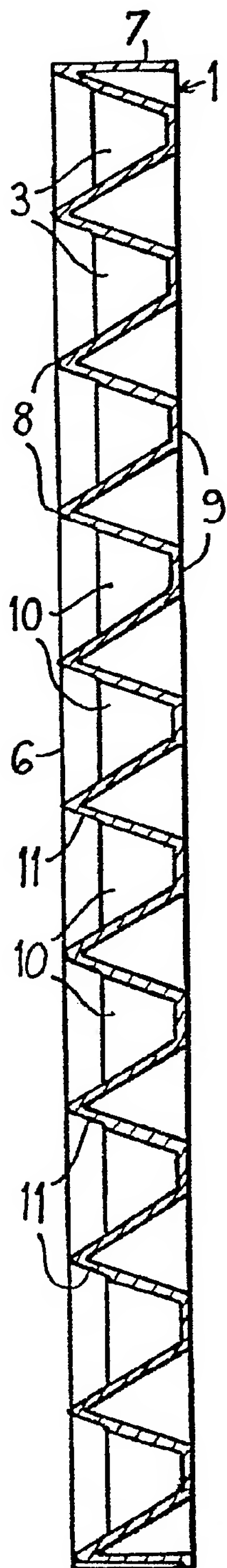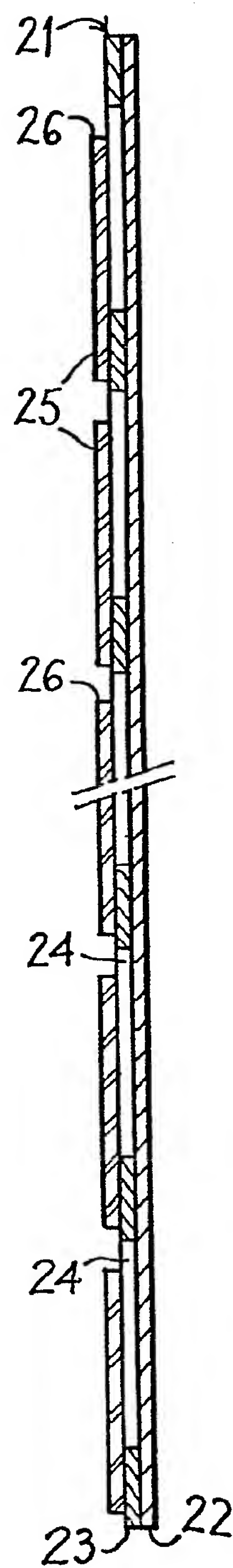Fig.7

Fig.2

Fig.6

European Patent Office

EUROPEAN SEARCH REPORT

Application number

EP 82 30 3387.3

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
A	US - A - 4 176 474 (R. O'SULLIVAN) * column 1, lines 37 to 43 * --	1,3,5	G 09 B 19/00
A	GB - A - 1 450 225 (C.A. TACEY) * page 1, lines 19 to 37 * --	1,3,5	
A	GB - A - 1 503 671 (J.H.M. MARTIN) * page 1, lines 9 to 39 * --		
A	US - E - 28 763 (A. EPSTEIN) * column 1, lines 39 to 65 * ----		TECHNICAL FIELDS SEARCHED (Int.Cl.³) G 09 B 1/00 G 09 B 19/00 G 09 B 29/00 G 09 D 1/00 G 09 F 7/00

CATEGORY OF CITED DOCUMENTS

X: particularly relevant if taken alone
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D: document cited in the application
L: document cited for other reasons

&: member of the same patent family, corresponding document

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Berlin	26-08-1982	BOTTERILL

EPO Form 1503.1 06.78